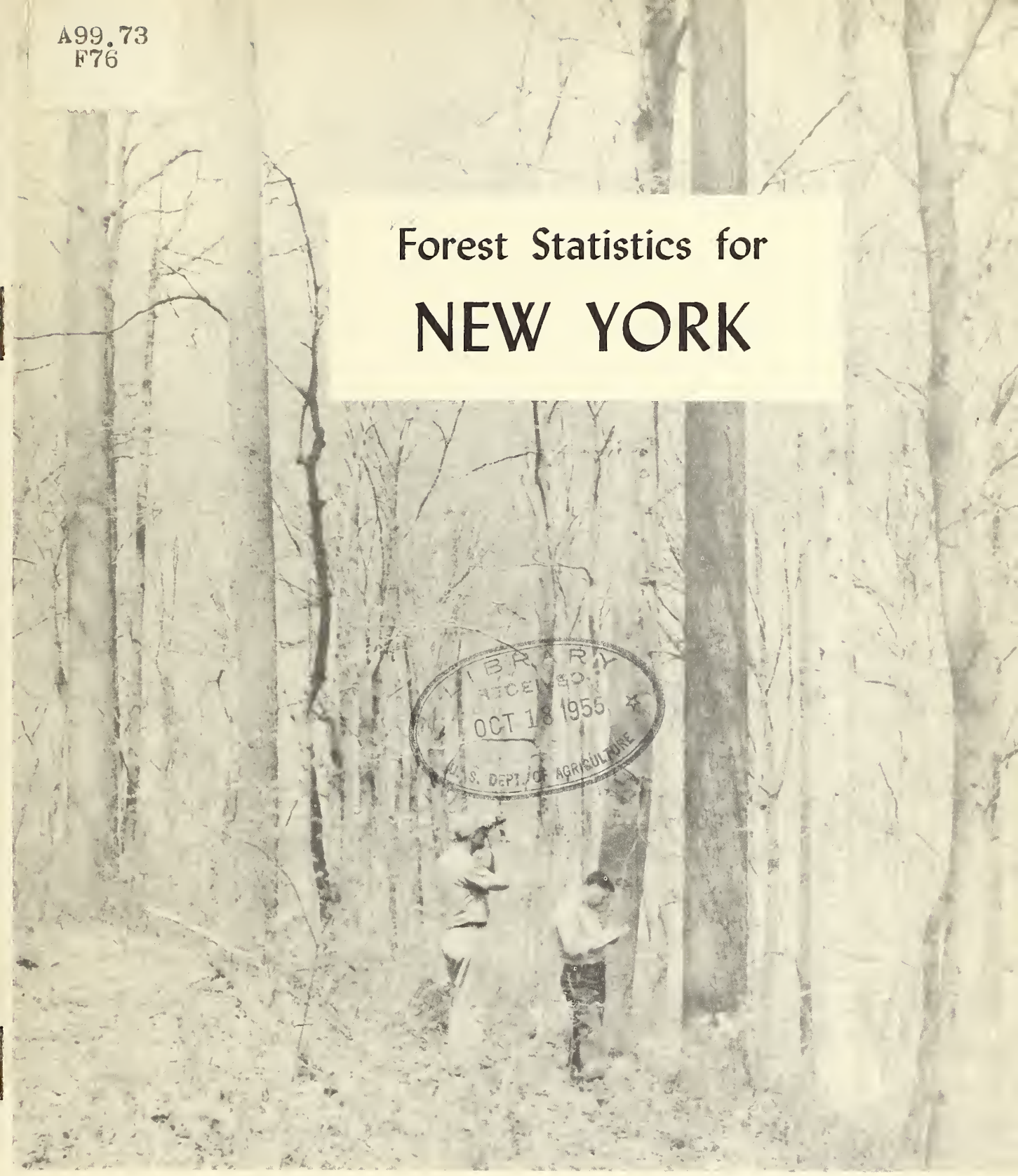
Forest Statistics for
NEW YORK



Northeastern Forest Experiment Station

Upper Darby, Pennsylvania
Ralph W. Marquis, Director

1955

United States Department of Agriculture • Forest Service

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mate the present rate of consumption and the probable future trend in requirements for forest products. (5) And to interpret these findings so that they may be useful in public and private policy-making.

The Forest Survey of New York was made by the Northeastern Forest Experiment Station. The New York Department of Conservation aided the Northeastern Station greatly. The Department provided the aerial photographs used and also cooperated in many other phases of the work.

This report on the Forest Survey presents estimates of forest area, timber volume, timber growth, and timber cut for the State of New York. Later a comprehensive report may be published that will interpret these statistics in the light of existing and anticipated economic conditions.

Ralph W. Marquis

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Director

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Forest Statistics for

NEW YORK

Prepared By

Division Of Forest Economics

Northeastern Forest Experiment Station
Forest Service, U.S. Dept. Agriculture

Nearly Half The State
Is Forested

The State of New York has a total land area of about 31 million acres. Forty-seven percent of this area is forested. Of the 14.5 million acres of forest land, about 12 million acres are commercial forest (fig. 1). This acreage is suitable and available for the production of industrial crops of timber.

The remaining forest acreage, which is classed as noncommercial, includes nearly 2,400,000 acres of productive forest land and about 95,700 acres of forest land that is incapable of producing commercial timber crops. Practically all of this noncommercial forest land is found in the State Forest Preserve in the Adirondacks and Catskills. This Forest Preserve comprises land owned by the State in the 12 Forest Preserve Counties in the Adirondacks and the 4 Forest Preserve Counties in the Catskills. It is in these two regions that the largest unbroken forest areas are found.

Nine Out Of Ten Acres
Are Privately Owned

About 93 percent of the commercial forest land in New York is privately owned. Twenty-nine percent (about 3.5 million acres) is found on farms--125,000 of them. Sixty-four percent (7.6 million acres) is in 42,000 industrial and other private ownerships.

Of the industrial and other private forests, practically all are in holdings of less than 5,000 acres. There are only 65 ownerships of more than 5,000 acres, and 20 of these contain 12 percent of the total commercial forest land.

Of the 7 percent of the commercial forest land that is in public ownership, more than three-fourths is held by the State, most of it in State Forests. Federal, county, and municipal holdings make up the balance of land in public ownership.

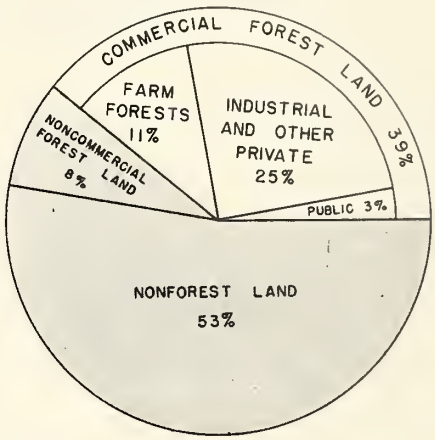

Figure 1.--Commercial forests cover 39 percent of the total land area of New York State.

Hardwood Cover
Types Predominate

Forests in which hardwoods predominate occupy 84 percent of the commercial forest land (fig. 2). The northern hardwood type, with its variations, is the most extensive; it covers 45 percent of the commercial forest area. The aspen-gray birch type and the oak types (mostly red oak) each make up more than 10 percent of the commercial forest area. The rest of the hardwood type area, which accounts for another 10 percent, is

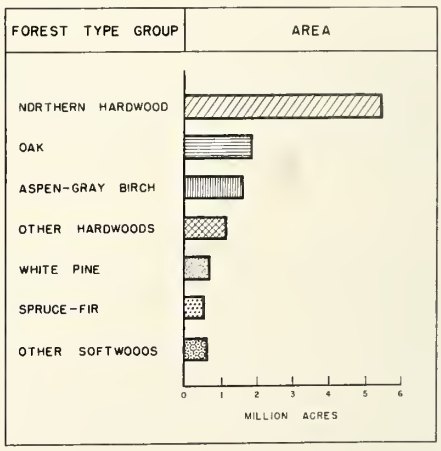

Figure 2.--Hardwoods predominate in New York forests.

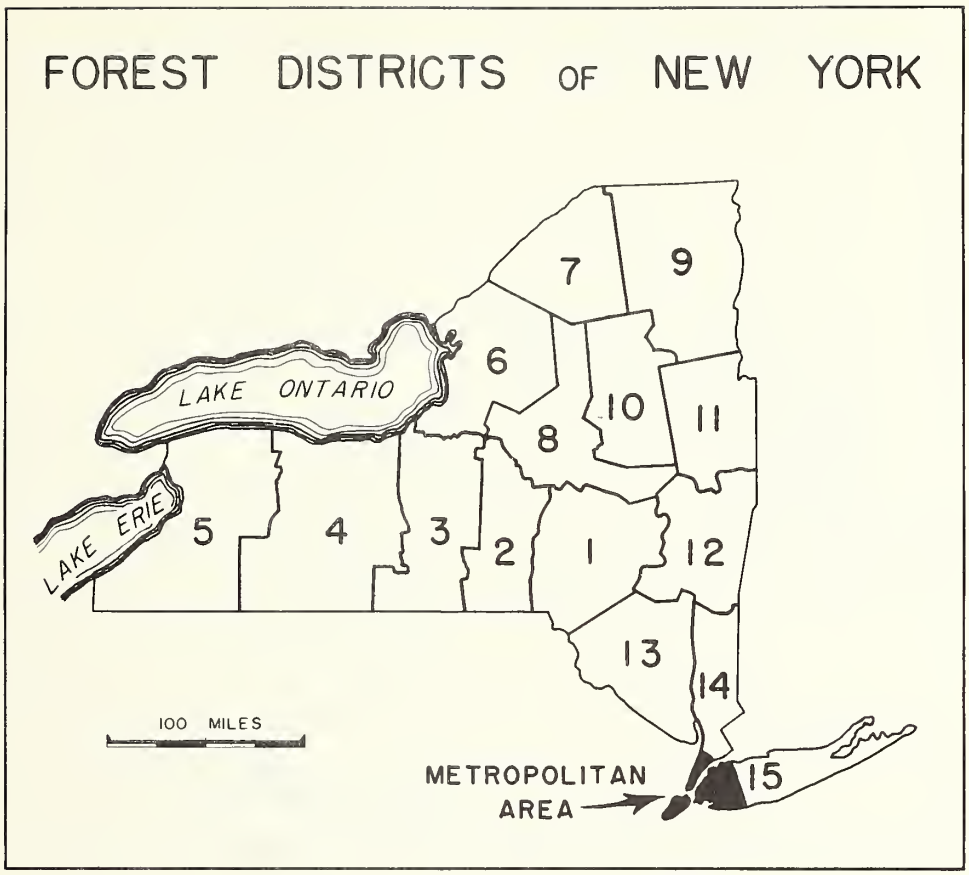

Figure 3.--The Forest Districts of New York. The metropolitan area was not included in the survey.

divided about equally between the ash-elm-maple type and other minor hardwood types.

Stands in which softwoods predominate are mostly of the white pine types and spruce-fir types. These two types occupy 11 percent of the commercial forest land; but on a third of this area the softwoods occur in mixture with hardwoods. Hemlock and other softwood types are found on the remaining 5 percent of the commercial forest land.

Heavy Sawtimber Stands Are Rather Scarce

Sawtimber stands occur on more than a third of the commercial forest land. But the heavier sawtimber stands,

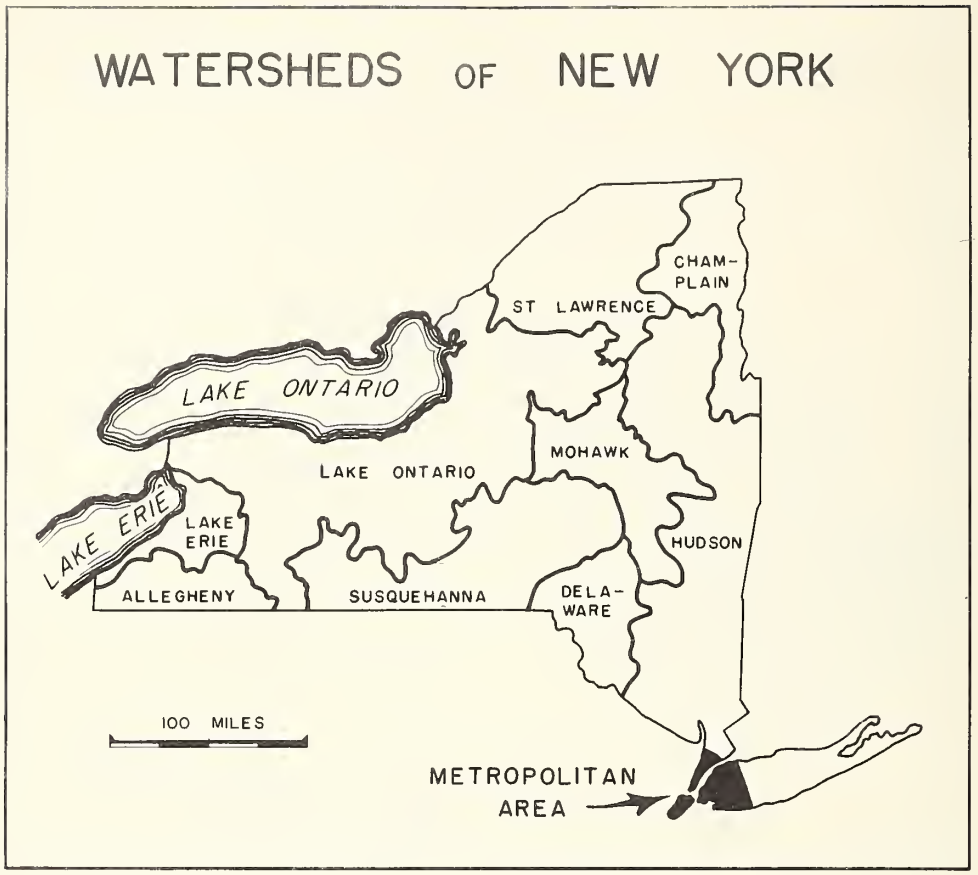

Figure 4.--The major watersheds of New York. Some small portions of the Housatonic and Passaic watersheds have been included with the Hudson watershed.

those that carry 5,000 or more board feet per acre, occupy only 12 percent of the total forest area (fig. 5). These heavier stands contain 47 percent of the total sawtimber volume. They average 8,200 board feet per acre.

Lightly stocked sawtimber stands, those that carry 1,500 to 5,000 board feet per acre, occupy 26 percent of the commercial forest land and carry 39 percent of the sawtimber volume. These stands average 3,200 board feet per acre. The rest of the sawtimber volume (14 percent) is scattered in poletimber and seedling-and-sapling stands.

Poletimber stands, which are dominated by the smaller trees, occupy 35 percent of the commercial forest area.

The rest of the forest area (27 percent of the commercial forest land) is so lightly stocked that it has practically no commercial timber volume. It includes seedling-and-sapling stands (24 percent of the commercial forest land) and nonstocked and other areas (3 percent).

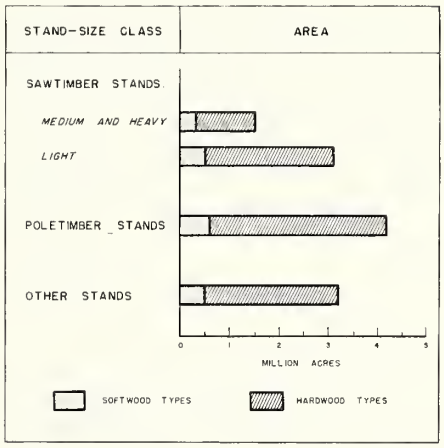

Figure 5.--Heavy stands of sawtimber are scarce.

Much Of The Volume Is In Small Trees

In 1950, the commercial forests of New York contained 11 billion cubic feet of growing stock.[1] Nearly 5 billion cubic feet (42 percent of the total growing stock) was in the poletimber trees--hardwoods 5.0 to 11.0 inches in diameter; softwoods 5.0 to 9.0 inches (fig. 6).

Included in the growing stock are 25 billion board feet (log scale, International $\frac{1}{4}$-inch rule) of sawlog material. Of this, about 12 billion board feet (46 percent of the total sawtimber volume) is in softwood trees 9.0 to 15.0 inches in diameter and in hardwood trees 11.0 to 15.0 inches. In general, the softwoods run smaller than the hardwoods: 60 percent of the softwood sawtimber volume is in trees of less than 15.0 inches diameter, as compared to 40 percent of the hardwood volume.

Only A Sixth Of Sawtimber Volume Now Merchantable

However, the estimate of 25 billion board feet of sawtimber must be qualified in terms of current availability. The sawmills depend chiefly on white pine, hemlock, yellow birch, sugar maple, oak, ash, basswood, and black cherry. Though these species accounted for nearly two-thirds of the

[1] GROWING STOCK IS THE NET VOLUME IN CUBIC FEET OF LIVE SAWTIMBER AND POLETIMBER TREES FROM STUMP TO A MINIMUM 4.0-INCH TOP (OF CENTRAL STEM) INSIDE BARK. DEDUCTIONS ARE MADE FOR ROT ONLY. IN EARLIER REPORTS THE VOLUME OF SOUND DEFECTS, AS WELL AS ROT, WAS DEDUCTED FROM GROWING STOCK.

sawtimber volume (17 billion board feet)/, only 8 billion board feet of these species were found in the heavier sawtimber stands. And when tree size and quality, as well as stand quality, were considered, no more than 4 billion board feet of these species were found to meet the logging and milling specifications that are in general use now.

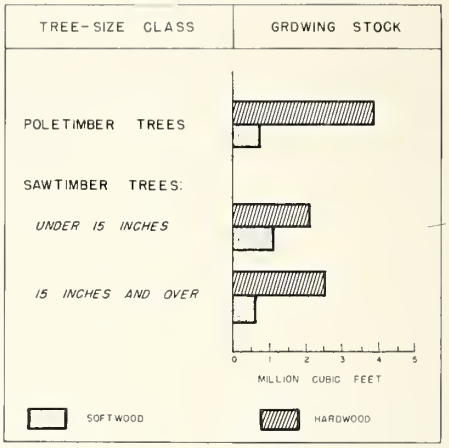

Figure 6.--A big part of the volume is in small trees.

Only Tenth Of Pulpwood Volume In Favored Species

According to pulpwood specifications developed by the Northeastern and Appalachian Technical Committees of the American Pulpwood Association, practically all of the growing stock can be used by the pulp industry--including large sawlogs and veneer-log material. In terms of these specifications, there are 120 million rough standard cords of pulpwood in sawtimber and poletimber trees. But these pulpwood estimates also must be qualified in terms of current use for pulp as well as competing demands for raw material for sawmills and other industries. Most of the New York pulp mills depend solely upon spruce, fir, and aspen. But less than one-tenth (11 million cords) of the total volume of wood that could be used for pulpwood is represented by these species. And only 8 million rough standard cords of fir, spruce, and aspen occur in the heavier stands (more than 15 cords per acre, all species).

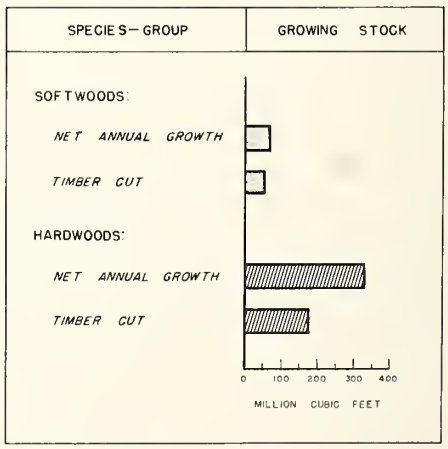

Figure 7.--The total growth exceeds the volume cut.

The rest of the 109 million cords of material that meets the quality requirements (though not the species preference) for pulp

use includes maple, beech, birch, and various other species that have not yet been used much for pulp.

Volume In Cull Trees And Limbs

In addition to the growing stock, New York's commercial forests contain a sizable volume of cull material--nearly 2.7 billion cubic feet of it. Of this, about 70 percent is the volume of sound wood found in trees that are not suitable for sawlogs now or prospectively because of defect or rot, or because they are not desirable species. The rest is the volume of wood in the limbs of live hardwood trees.

Total Growth Exceeds Total Timber Cut

In 1952, the total growth was estimated to be about 498 million cubic feet (fig. 7). This includes 138 million cubic feet (28 percent) of ingrowth--the volume of trees reaching inventory size during the year. But nearly 105 million cubic feet of growing stock were lost through mortality due to causes such as fire, insects, diseases, and suppression. The difference between the total growth and the mortality is the net annual growth: 393 million cubic feet.

In the same year, the annual cut for timber products was only 141 million cubic feet. The surplus of 252 million cubic feet was added to the growing stock. Softwood growth of 66 million cubic feet exceeded the cut of softwoods by 14 million cubic feet. Hardwood growth of 327 million cubic feet exceeded the cut of hardwoods by 238 million cubic feet.

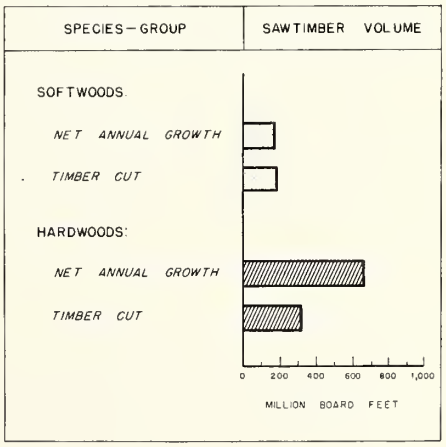

Figure 8.--Sawtimber growth also exceeds volume cut.

The overall growth-cut relationship for sawtimber also appeared favorable: 1 billion board feet grown during the year; only 630 million board feet harvested (fig. 8). However, the surplus was all

in hardwoods; softwood growth of 214 million board feet fell short of the cut by 11 million board feet. As in the case of timber volume, these estimates include many species and grades of logs that are not accepted by the lumber industry at this time.

In terms of local pulpwood specifications, net annual growth in 1952 exceeded 4 million cords (all species). The annual cut was less than 2 million cords (all products). However, the annual cut of spruce and fir--the most important pulpwood species--nearly equalled the annual growth of these two species.

Blowdown Damage

The survey was completed before the severe windstorm of November 25, 1950, which damaged stands on an estimated 475,700 acres of commercial forest land. The storm changed the stand-size distribution, the volume of sawtimber, and the volume of growing stock. Estimates of these changes have been prepared from data provided by the College of Forestry of the State University of New York at Syracuse. However, the amount of damage has not been deducted from the figures used in this report, except for tables 23, 24, and 25.

Table 1.--Land area and forest area of New York, 1950

Class of land[1]	Area	
	Acres	Percent
Forest land:		
Commercial	12,002,500	39
Noncommercial		
Reserved[2]	2,380,500	8
Unproductive[3]	67,300	(4/)
Total forest land	14,450,300	47
Nonforest land[5]	16,233,900	53
All land[6]	30,684,200	100

[1]See Appendix for definitions.

[2]Includes 2,201,800 acres of productive and 17,700 acres of nonproductive forest land in the State Forest Preserve. It also includes 161,000 acres of forest land reserved from timber cutting in State and county parks. Total area of the Preserve is 2,418,583.59 acres, including 199,079.42 acres of water. State ownership figures are as of September 30, 1952.

[3]Not reserved from timber cutting.

[4]Less than 1 percent.

[5]Includes 111,500 acres of water according to survey standards of area classification but defined by the Bureau of the Census as land.

[6]From Areas of the United States, 1950, Bureau of the Census.

Table 2.--Land area and commercial forest area of New York, by counties, 1950

County	Land area	Total forest-land area	Commercial forest area	
	Acres	Acres	Acres	Percent
Albany	339,800	94,900	93,900	28
Allegany	670,700	244,400	244,400	36
Broome	454,400	180,000	179,400	39
Cattaraugus	854,400	421,300	363,500	43
Cayuga	447,300	89,400	87,200	19
Chautauqua	691,200	260,500	260,500	38
Chemung	263,700	109,100	108,800	41
Chenango	581,100	217,400	217,400	37
Clinton	677,800	403,600	390,700	58
Columbia	411,500	157,700	152,700	37
Cortland	321,300	97,300	97,300	30
Delaware	940,800	487,700	448,500	48
Dutchess	522,200	235,900	234,700	45
Erie	674,600	143,500	139,000	21
Essex	1,168,600	1,016,800	551,100	47
Franklin	1,078,400	833,100	609,800	57
Fulton	318,100	219,500	171,500	54
Genesee	320,700	57,900	57,900	18
Greene	417,900	247,000	183,300	44
Hamilton	1,118,100	1,081,500	423,600	38
Herkimer	922,800	595,500	327,900	36
Jefferson	827,500	193,400	167,300	20
Lewis	827,500	491,700	477,600	58
Livingston	408,300	64,200	64,200	16
Madison	423,100	114,600	114,600	27
Monroe	430,700	34,100	34,100	8
Montgomery	261,800	48,000	48,000	18
Nassau	192,000	28,400	26,800	14
Niagara	341,100	26,700	26,300	8
Oneida	785,300	284,300	281,900	36
Orleans	253,400	21,700	21,700	9
Onondaga	506,900	92,800	92,500	18
Ontario	415,400	77,000	77,000	19
Orange	530,600	277,400	255,400	48
Oswego	619,600	287,700	285,100	46
Otsego	648,300	223,600	222,100	34

(Continued)

Table 2.--Continued.

County	Land area	Total forest-land area	Commercial forest area	
	Acres	Acres	Acres	Percent
Putnam	150,400	103,200	96,300	64
Rensselaer	425,600	184,300	184,300	43
Rockland	113,900	82,400	62,600	55
St. Lawrence	1,774,100	1,023,500	892,600	50
Saratoga	521,000	289,700	276,800	53
Schenectady	133,800	30,200	30,200	23
Schoharie	400,000	180,900	180,200	45
Schuyler	211,800	80,400	80,000	38
Seneca	211,200	26,600	26,500	13
Steuben	901,100	367,600	367,200	41
Suffolk	590,100	305,900	296,400	50
Sullivan	631,000	419,400	410,000	65
Tioga	336,000	125,200	125,200	37
Tompkins	314,200	105,000	102,800	33
Ulster	731,500	576,600	442,900	61
Warren	565,100	461,400	289,200	51
Washington	535,700	218,400	204,100	38
Wayne	388,500	112,500	112,500	29
West Chester	278,400	147,800	135,300	49
Wyoming	382,700	85,200	85,200	22
Yates	220,200	64,500	64,500	29
Total[1]	30,483,200	14,450,300	12,002,500	39

[1]Excluding five metropolitan counties: Bronx, Kings, New York, Queens, and Richmond.

Table 3.--Ownership of commercial forest area of New York, 1950

Ownership class	Commercial forest area	
	Acres	Percent
Private:		
Farm forests:[1]		
On 64,300 farms of 100 acres and more[2]	3,064,700	26
On 60,700 farms smaller than 100 acres	407,800	3
Total (125,000 holdings)	3,472,500	29
Industrial and other forests:		
8 holdings of more than 50,000 acres	898,900	8
12 holdings of 25,000 to 50,000 acres	421,800	4
45 holdings of 5,000 to 25,000 acres	521,100	4
42,000 holdings smaller than 5,000 acres	5,792,500	48
Total (42,065 holdings)	7,634,300	64
All private (167,065 holdings)	11,106,800	93
Public:		
Federal	98,700	1
State[3]	713,700	6
County	35,100	(4/)
Municipal	48,200	(4/)
All public	895,700	7
Total commercial forest land	12,002,500	100

[1]Census of Agriculture, 1950.

[2]Estimated on the assumption that all of the 100-acre-and-larger farms contain some forest acreage.

[3]Includes commercial forest land administered by the New York State Conservation Department as State Forests and Game Management Areas, amounting to 567,797 and 130,333 acres respectively. All State ownership figures are as of September 30, 1952.

[4]Less than 1 percent.

Table 4.--Forest types on commercial forest area of New York, 1950

Forest type	Commercial forest land	
	Acres	Percent
White pine	467,300	4
White pine-northern hardwood	203,000	2
Hemlock	374,500	3
Pitch pine	107,800	1
Spruce-fir	366,400	3
Spruce-fir-northern hardwood	224,300	2
Cedar-tamarack-spruce	144,500	1
Northern hardwood	5,193,700	43
Northern hardwood-spruce-fir	268,400	2
Aspen-gray birch	1,635,500	13
Paper birch	88,500	1
Ash-elm-maple	844,000	7
Red oak	979,100	8
White oak	386,300	3
Chestnut oak	334,800	3
Oak-white pine	182,800	2
Minor forest types[1]	201,600	2
All types	12,002,500	100

[1]Includes northern hardwood-white pine, pitch pine-oak, oak-pitch pine, river birch-sycamore, eastern red-cedar, Atlantic white-cedar, sweetgum--yellow-poplar, and bottomland hardwood types.

Table 5.--Commercial forest area of New York by stand-size class and forest-type group, 1950

Forest-type group	Sawtimber stands		Poletimber stands		Seedling-and-sapling stands and other areas	Total commercial forest land
	More than 5,000 board feet per acre	1,500 to 5,000 board feet per acre	More than 600 cubic feet per acre	200 to 600 cubic feet per acre		
	Acres	Acres	Acres	Acres	Acres	Acres
White pine	81,700	121,500	64,900	58,200	141,000	467,300
White pine-northern hardwood	19,600	72,900	46,000	50,700	13,800	203,000
Spruce-fir	40,200	67,700	100,000	47,000	111,500	366,400
Spruce-fir-northern hardwood	54,900	58,000	65,100	28,000	18,300	224,300
Hemlock	118,400	181,900	36,500	25,600	12,100	374,500
Other softwood types[1]	7,500	28,200	40,000	51,900	192,900	320,500
Northern hardwood	844,400	1,811,400	1,202,700	668,300	666,900	5,193,700
Northern hardwood-spruce-fir	52,100	79,300	61,300	54,000	21,700	268,400
Aspen-gray birch	10,700	36,800	207,500	246,100	1,134,400	1,635.500
Ash-elm-maple	93,200	157,400	137,000	136,600	319,800	844.000
Red oak	78,900	247,200	254,200	194,500	204,300	979.100
White oak	26,500	87,700	93,300	51,000	127,800	386,300
Chestnut oak	4,700	63,100	148,900	49,000	69,100	334,800
Oak-white pine	20,800	50,000	27,200	38,800	46,000	182,800
Other hardwood types[2]	10,300	31,900	39,300	52,400	88,000	221,900
All types	1,463,900	3,095,000	2,523,900	1,752,100	3,167,600	12,002,500
Percent	12	26	21	14	27	100

[1]Includes pitch pine, cedar-tamarack-spruce, pitch pine-oak, eastern redcedar, and Atlantic white-cedar types.

[2]Includes paper birch, northern hardwood-white pine, river birch-sycamore, sweetgum--yellow-poplar, and bottomland hardwood types.

Table 6.--Commercial forest area of New York by cords-per-acre class and forest-type group, 1950

Forest-type group	Cords-per-acre class		
	Under 5 cords per acre	5 to 15 cords per acre	Over 15 cords per acre
	Thousand acres	Thousand acres	Thousand acres
White pine	174	117	176
White pine-northern hardwood	38	94	71
Spruce-fir	111	126	129
Spruce-fir-northern hardwood	28	65	131
Hemlock	24	101	250
Other softwood types[1]	211	87	23
Northern hardwood	771	1,901	2,522
Northern hardwood-spruce-fir	31	112	125
Aspen-gray birch	1,106	447	82
Ash-elm-maple	292	270	282
Red oak	248	480	251
White oak	133	173	80
Chestnut oak	68	199	68
Oak-white pine	56	67	60
Other hardwood types[2]	106	81	35
All types	3,397	4,320	4,285

[1]Includes pitch pine, cedar-tamarack-spruce, pitch pine-oak, eastern redcedar, and Atlantic white-cedar types.

[2]Includes paper birch, northern hardwood-white pine, river birch-sycamore, sweetgum--yellow-poplar, and bottomland hardwood types.

Table 7.--Area of hardwood sawtimber stands in New York by stand-quality class and forest-type group, 1950

Forest-type group	Stands in which--		
	50% or more of the hardwood sawtimber trees contain grade 1 and/or 2 logs	1 to 49% of the hardwood sawtimber trees contain grade 1 and/or 2 logs	No hardwood sawtimber trees contain grade 1 and/or 2 logs
	Acres	Acres	Acres
Northern hardwood	187,200	1,861,100	607,500
Northern hardwood-spruce-fir	--	103,300	28,100
Aspen-gray birch	--	21,400	26,100
Ash-elm-maple	15,900	191,300	43,400
Red oak	46,500	180,200	99,400
White oak	11,100	94,700	8,400
Chestnut oak	--	56,200	11,600
Oak-white pine	7,800	44,600	18,400
Other hardwood types[1]	--	23,400	18,800
All hardwood types	268,500	2,576,200	861,700
Percent	7	70	23

[1]Includes paper birch, northern hardwood-white pine, river birch-sycamore, sweetgum--yellow-poplar, and bottomland hardwood types.

Table 8.--Commercial forest area of New York by stand-size class and watershed, 1950

Watershed	Saw-timber stands	Pole-timber stands	Better stocked[1] seedling-and-sapling stands	Poorly stocked seedling-and-sapling stands; nonstocked and other areas	All stands	
	Acres	Acres	Acres	Acres	Acres	Percent
Allegheny River	202,800	227,500	51,400	105,300	587,000	5
Lake Erie	90,300	93,700	86,800	11,200	282,000	2
Lake Ontario	996,300	668,600	406,000	240,900	2,311,800	19
Susquehanna River	496,700	615,200	233,400	158,000	1,503,300	12
Delaware River	335,400	431,700	83,700	54,300	905,100	8
Hudson River	1,165,800	1,009,600	677,500	158,000	3,010,900	25
Mohawk River	376,400	189,900	93,800	75,000	735,100	6
Lake Champlain	320,900	382,800	170,100	38,700	912,500	8
St. Lawrence River	574,300	657,000	221,900	301,600	1,754,800	15
Total	4,558,900	4,276,000	2,024,600	1,143,000	12,002,500	100

[1] 40 percent or better.

Table 9.--Net volume of live timber on commercial forest land in New York, by species, 1950

Species	Growing stock[1]	Saw-timber[2]	Suitable for pulpwood[3]
	Million cu.ft.	Million bd.ft.	Thousand cords
Hemlock	880	2,305	9,431
White pine	753	2,284	8,071
Spruce	520	1,426	5,573
Fir	173	229	1,855
Other softwoods	157	258	1,682
All softwoods	2,483	6,502	26,612
Sugar maple	1,803	4,639	20,005
Beech	964	2,749	10,699
Yellow birch	878	2,446	9,736
Red maple	1,225	1,919	13,586
Red oak	692	1,639	7,681
Elm	460	1,309	5,102
Ash	482	943	5,345
Basswood	367	914	4,074
White oak	233	589	2,588
Black cherry	199	566	2,205
Hickory	131	249	1,458
Aspen	351	246	3,896
Chestnut oak	219	207	2,429
Other hardwoods	418	564	4,634
All hardwoods	8.422	18,979	93,438
All species	10,905	25,481	120,050

[1]See definitions in Appendix. Growing stock includes poletimber and sawtimber.

[2]Log scale, International ¼-inch rule.

[3]Four-foot bolts including bark. Pulpwood volume includes most of the sawtimber volume.

Table 10.--Net volume of live timber and numbers of trees on commercial forest land in New York, by tree diameter, 1950

Diameter class[1] (in inches at breast height)	Numbers of trees	Growing stock	Saw-timber
	Thousand trees	Million cu.ft.	Million bd.ft.
Softwoods:			
6	147,451	326	--
8	77,295	403	--
10	39,108	399	1,234
12	23,732	399	1,414
14	13,866	336	1,285
16	6,999	242	956
18	3,386	154	647
20	1,507	85	357
22	850	60	254
24	385	32	139
26	253	25	115
28 and more	179	22	101
All softwoods	315,011	2,483	6,502
Hardwoods:			
6	441,470	1,082	--
8	244,231	1,352	--
10	140,317	1,460	--
12	77,960	1,137	4,005
14	43,635	944	3,782
16	25,635	776	3,235
18	14,823	564	2,541
20	7,032	339	1,618
22	4,668	286	1,367
24	2,884	204	993
26	1,530	130	675
28	554	49	247
30	303	41	205
32	203	29	153
34	129	20	107
36 and more	86	9	51
All hardwoods	1,005,460	8,422	18,979

[1]Two-inch diameter classes are used. The diameter indicated is the midpoint of the class.

Table 11.--Net volume of live timber on commercial forest land in New York, by stand-size class and species group, 1950

Stand-size class and species group	Growing stock	Saw-timber	Suitable for pulpwood
	Million cu.ft.	Million bd.ft.	Thousand cords
Sawtimber stands:			
More than 5,000 board feet per acre			
Softwood	966	3,394	10,352
Hardwood	2,239	8,562	24,845
Total	3,205	11,956	35,197
1,500 to 5,000 board feet per acre			
Softwood	883	2,271	9,463
Hardwood	3,129	7,631	34,712
Total	4,012	9,902	44,175
Poletimber stands:			
More than 600 cubic feet per acre			
Softwood	394	519	4,223
Hardwood	2,091	1,804	23,201
Total	2,485	2,323	27,424
200 to 600 cubic feet per acre			
Softwood	130	141	1,395
Hardwood	625	478	6,933
Total	755	619	8,328
All other stands:			
Softwood	110	177	1,179
Hardwood	338	504	3,747
Total	448	681	4,926
All stands:			
Softwood	2,483	6,502	26,612
Hardwood	8,422	18,979	93,438
Total	10,905	25,481	120,050

Table 12.--Net volume of live timber on commercial forest land in New York, by forest type, 1950

Forest type	Growing stock	Saw-timber	Suitable for pulpwood
	Million cu.ft.	Million bd.ft.	Thousand cords
White pine	490	1,386	5,394
White pine-northern hardwood	186	456	2,048
Hemlock	562	1,551	6,186
Spruce-fir	347	894	3,820
Spruce-fir-northern hardwood	292	848	3,215
Other softwood types[1]	303	234	3,336
Northern hardwood	5,802	14,446	63,873
Northern hardwood-spruce-fir	247	707	2,719
Ash-elm-maple	658	1,662	7,244
Aspen-gray birch	452	405	4,976
Red oak	707	1,425	7,783
White oak	242	605	2,664
Chestnut oak	236	301	2,598
Oak-white pine	117	331	1,288
Other hardwood types[2]	264	230	2,906
All types	10,905	25,481	120,050

[1]Includes pitch pine, cedar-tamarack-spruce, pitch pine-oak, eastern redcedar, and Atlantic white-cedar types.

[2]Includes paper birch, northern hardwood-white pine, river birch-sycamore, sweetgum--yellow-poplar, and bottomland hardwood types.

Table 13.--Net volume of growing stock on commercial forest land in New York, by stand-size class and tree-size class, 1950

Stand-size class	Growing stock		
	Sawtimber trees	Poletimber trees	Total
	Million cu.ft.	Million cu.ft.	Million cu.ft.
Sawtimber stands:			
More than 5,000 board feet per acre	2,673	532	3,205
1,500 to 5,000 board feet per acre	2,487	1,525	4,012
Total	5,160	2,057	7,217
Poletimber stands:			
More than 600 cubic feet per acre	734	1,751	2,485
200 to 600 cubic feet per acre	209	546	755
Total	943	2,297	3,240
All other stands	179	269	448
All stands	6,282	4,623	10,905

Table 14.--Average net volume of live timber per acre of commercial forest land in New York, by stand-size class, 1950

Stand-size class (and acreage of each class)	Growing stock	Saw-timber
	Cubic feet	Board feet
Sawtimber stands:		
More than 5,000 board feet per acre (1,463,900 acres)	2,200	8,200
1,500 to 5,000 board feet per acre (3,095,000 acres)	1,300	3,200
Poletimber stands:		
More than 600 cubic feet per acre (2,523,900 acres)	1,000	900
200 to 600 cubic feet per acre (1,752,100 acres)	400	400
Other stands (3,167,600 acres)	100	200
Average, all stands (12,002,500 acres)	900	2,100

Table 15.--Quality of hardwood sawtimber on commercial forest land in New York, by species, 1950

Species	Standard lumber logs			Tie and timber logs[1]	Total
	Grade 1	Grade 2	Grade 3		
	Million bd.ft.	Million bd.ft.	Million bd.ft.	Million bd.ft.	Million bd.ft.
Sugar maple	1,395	1,298	1,622	324	4,639
Beech	428	554	1,391	376	2,749
Yellow birch	981	534	876	55	2,446
Red maple	470	412	816	221	1,919
Red oak	448	454	511	226	1,639
Elm	466	337	390	116	1,309
Ash	321	185	397	40	943
Basswood	314	188	376	36	914
Black cherry	177	162	178	49	566
Aspen	50	37	111	48	246
Other hardwood	402	408	590	209	1,609
All hardwood	5,452	4,569	7,258	1,700	18,979
Percent	29	24	38	9	100

[1]Not suitable for standard lumber.

Table 16.--Quality of softwood sawtimber on commercial forest land in New York, by species, 1950

Species	Log grade 1	Log grade 2	Log grade 3	Total
	Million bd.ft.	Million bd.ft.	Million bd.ft.	Million bd.ft.
White pine[1]	23	891	1,370	2,284
Percent	1	39	60	100

[1] Other softwoods not graded.

Table 17.--Net annual growth of live timber on commercial forest land in New York, by tree-size class and species group, 1952

Tree-size class and species group	Growing stock	Saw-timber
	Thousand cu.ft.	Thousand bd.ft.
Sawtimber trees:		
Softwood	58,200	214,400
Hardwood	186,800	826,900
	245,000	1,041,300
Poletimber trees:		
Softwood	8,200	--
Hardwood	140,100	--
	148,300	--
Sawtimber and poletimber trees:		
Softwood	66,400	214,400
Hardwood	326,900	826,900
Total	393,300	1,041,300

Table 18.--Annual cut of live timber from commercial forest land in New York by tree-size class and species group, 1952

Tree-size class and species group	Growing stock	Saw-timber
	Thousand cu.ft.	Thousand bd.ft.
Sawtimber trees:		
Softwood	45,800	224,900
Hardwood	78,400	405,500
	124,200	630,400
Poletimber trees:		
Softwood	5,500	--
Hardwood	10,900	--
	16,400	--
Sawtimber and poletimber trees:		
Softwood	51,300	224,900
Hardwood	89,300	405,500
Total	140,600	630,400

Table 19.--Relationship of annual cut to net annual growth in New York, by tree-size class and species group, 1952

Tree-size class and species group	Annual cut as percentage of growth	
	Cubic-foot basis	Board-foot basis
	Percent	Percent
Sawtimber trees:		
Softwood	79	105
Hardwood	42	49
Weighted average	51	61
Poletimber trees:		
Softwood	67	--
Hardwood	8	--
Weighted average	11	--
Sawtimber and poletimber trees:		
Softwood	77	105
Hardwood	27	49
Weighted average	36	61

Table 20.--Distribution of net annual growth and annual cut of growing stock in New York by tree-size class and species group, 1952

Tree-size class and species group	Net growth		Annual cut	
	Thousand cu.ft.	Percent	Thousand cu.ft.	Percent
Sawtimber trees:				
Softwood	58,200	15	45,800	32
Hardwood	186,800	47	78,400	56
	245,000	62	124,200	88
Poletimber trees:				
Softwood	8,200	2	5,500	4
Hardwood	140,100	36	10,900	8
	148,300	38	16,400	12
Sawtimber and poletimber trees:				
Softwood	66,400	17	51,300	36
Hardwood	326,900	83	89,300	64
Total	393,300	100	140,600	100

Table 21.--Components of net annual growth in New York, by species group, 1952

Item	Softwood	Hardwood	All species
	Thousand cu.ft.	Thousand cu.ft.	Thousand cu.ft.
Growth on growing stock	74,100	285,400	359,500
Ingrowth--saplings that became poletimber in 1952	26,400	111,800	138,200
Total	100,500	397,200	497,700
Annual mortality	-34,100	-70,300	-104,400
Net annual growth	66,400	326,900	393,300

Table 22.--Components of annual cut of growing stock in New York, 1952

Item	Percentage of total annual cut
	Percent
Timber products from growing stock:	
Sawlogs	52
Pulpwood	15
Fuelwood	10
Veneer	2
Posts	2
Other products	3
Total output (119 million cubic feet)	84
Logging residues of growing stock (22 million cubic feet)	16
Total annual cut (141 million cubic feet)	100

Table 23.--Estimates of forest area and growing-stock changes by stand-size class in New York following the storm of November 25, 1950

Stand-size class	Area		Growing stock					
			Total			Sawtimber		
	Loss	Gain	Loss	Gain	Net change	Loss	Gain	Net change
	Acres	Acres	Thousand cu.ft.	Thousand cu.ft.	Thousand cu.ft.	Thousand bd.ft.	Thousand bd.ft.	Thousand bd.ft.
Sawtimber stands:								
More than 5,000 board feet per acre	83,400	0	183,900	0	-183,900	764,200	0	-764,200
1,500 to 5,000 board feet per acre	30,700	70,600	44,800	50,800	+ 6,000	125,000	211,100	+ 86,100
Poletimber stands:								
More than 600 cubic feet per acre	6,100	36,000	12,600	12,600	0	13,800	40,600	+ 26,800
200 to 600 cubic feet per acre	1,000	6,900	1,100	1,900	+ 800	1,200	2,700	+ 1,500
Other stands	0	7,700	0	0	0	0	0	0
Total	--	--	242,400	65,300	-177,100	904,200	254,400	-649,800

Table 24.--Commercial forest area of New York by stand-size class before and after the storm of November 25, 1950

Stand-size class	Before storm	After storm	Change
	Acres	Acres	Acres
Sawtimber stands:			
More than 5,000 board feet per acre	1,463,900	1,380,500	-83,400
1,500 to 5,000 board feet per acre	3,095,000	3,134,900	+39,900
Poletimber stands:			
More than 600 cubic feet per acre	2,523,900	2,553,800	+29,900
200 to 600 cubic feet per acre	1,752,100	1,758,000	+ 5,900
Other stands	3,167,600	3,175,300	+ 7,700
Total	12,002,500	12,002,500	--

Table 25.--Net volume of growing stock on commercial forest land in New York, by stand-size class, before and after the storm of November 25, 1950

Stand-size class	Growing stock			Sawtimber		
	Before storm	After storm	Change	Before storm	After storm	Change
	Million cu.ft.	Million cu.ft.	Million cu.ft.	Million bd.ft.	Million bd.ft.	Million bd.ft.
Sawtimber stands:						
More than 5,000 board feet per acre	3,205	3,021	-184	11,956	11,192	-764
1,500 to 5,000 board feet per acre	4,012	4,018	+ 6	9,902	9,988	+ 86
Poletimber stands:						
More than 600 cubic feet per acre	2,485	2,485	0	2,323	2,350	+ 27
200 to 600 cubic feet per acre	755	756	+ 1	619	620	+ 1
Other stands:	448	448	0	681	681	0
Total	10,905	10,728	-177	25,481	24,831	-650

Table 26.--Commercial forest area by stand-size class and noncommercial forest area of New York by State Forest Districts, 1950

District number	Commercial forest area				Noncommercial forest area[1]	Total forest area
	Sawtimber stands	Poletimber stands	Seedling-and-sapling stands	Other areas		
	Acres	Acres	Acres	Acres	Acres	Acres
1	419,700	319,900	68,500	42,700	41,400	892,200
2	170,000	232,700	101,900	6,800	600	512,000
3	178,500	243,800	176,800	14,700	5,000	618,800
4	296,600	449,000	276,200	48,600	900	1,071,300
5	317,400	299,500	262,000	75,200	62,700	1,016,800
6	435,300	258,400	201,100	35,200	42,800	972,800
7	298,700	305,600	268,700	19,600	130,900	1,023,500
8	342,000	148,300	146,300	21,200	270,000	927,800
9	522,200	658,500	304,700	66,200	701,900	2,253,500
10	375,400	137,100	82,600	--	705,900	1,301,000
11	371,900	259,900	138,300	--	199,400	969,500
12	283,400	202,900	158,100	--	69,700	714,100
13	406,000	452,300	300,800	11,800	184,900	1,355,800
14	100,900	222,700	142,700	--	20,600	486,900
15	40,900	85,400	196,900	--	11,100	334,300
Total	4,558,900	4,276,000	2,825,600	342,000	2,447,800	14,450,300

[1]Includes 2,380,500 acres of forest land reserved from timber cutting.

Table 27.--Commercial forest area of New York by forest-type group and State Forest District, 19[illegible]

District number	White pine types	Spruce-fir types[1]	Other softwood types	Northern hardwood type	Oak types[2]	Aspen-gray birch type	Ash-elm-maple type	Other hardwood types	All types
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
1	80,200	5,500	54,900	519,100	77,700	26,400	17,500	69,500	850,800
2	65,700	5,900	47,300	273,300	36,600	19,000	31,600	32,000	511,400
3	26,800	9,700	23,900	320,300	54,400	105,300	56,600	16,800	613,800
4	40,900	--	16,200	366,200	253,000	210,700	160,000	23,400	1,070,400
5	3,500	--	9,800	522,900	88,800	179,700	149,400	--	954,100
6	26,100	69,600	50,200	471,800	11,200	159,400	75,400	66,300	930,000
7	15,100	72,400	72,200	309,900	28,500	238,400	99,000	57,100	892,600
8	11,400	58,300	19,600	426,000	5,500	69,200	30,500	37,300	657,800
9	142,000	215,200	89,300	673,000	31,800	265,700	12,300	122,300	1,551,600
10	23,900	100,900	--	374,700	--	49,900	--	45,700	595,100
11	125,700	13,800	72,500	296,300	63,400	76,400	47,900	74,100	770,100
12	81,600	27,900	41,900	191,900	130,900	68,900	40,600	60,700	644,400
13	20,800	11,500	101,200	390,500	480,400	80,400	70,400	15,700	1,170,900
14	6,600	--	7,800	57,800	250,800	86,100	52,800	4,400	466,300
15	--	--	88,200	--	187,200	--	--	47,800	323,200
Total	670,300	590,700	695,000	5,193,700	1,700,200	1,635,500	844,000	673,100	12,002,500

[1]Excluding 144,500 acres of the cedar-tamarack-spruce type.

[2]Excluding 234,400 acres of the oak-pine type.

Table 28.--Net volume of live sawtimber on commercial forest land in New York by stand-size class and State Forest District, 1950

District number	Sawtimber stands	Poletimber stands	Other stands	All stands
	Million bd.ft.	Million bd.ft.	Million bd.ft.	Million bd.ft.
1	1,993	138	23	2,154
2	710	98	1	809
3	949	196	66	1,211
4	1,365	444	157	1,966
5	1,760	340	89	2,189
6	2,110	198	55	2,363
7	1,263	214	64	1,541
8	1,738	93	43	1,874
9	2,624	470	33	3,127
10	2,479	134	6	2,619
11	1,755	134	41	1,930
12	1,101	88	20	1,209
13	1,413	259	60	1,732
14	426	113	8	547
15	172	23	15	210
Total	21,858	2,942	681	25,481

Table 29.--Net volume of growing stock on commercial forest land in New York by stand-size class and State Forest District, 1950

District number	Sawtimber stands	Poletimber stands	Other stands	All stands
	Million cu.ft.	Million cu.ft.	Million cu.ft.	Million cu.ft.
1	652	235	20	907
2	252	149	4	405
3	315	198	40	553
4	410	377	98	885
5	535	285	42	862
6	700	191	44	935
7	396	205	31	632
8	559	97	17	673
9	887	539	41	1,467
10	700	104	9	813
11	670	171	24	865
12	427	135	15	577
13	527	360	33	920
14	136	147	14	297
15	51	47	16	114
Total	7,217	3,240	448	10,905

APPENDIX

DEFINITIONS OF TERMS

Forest Area

Forest-land area.--Includes (a) lands that are at least 10 percent stocked by trees of any size and are capable of producing timber or other wood products, or of exerting an influence on the climate or on the water regime; (b) land from which the trees described in (a) have been removed to less than 10 percent stocking and that has not been developed for other use; and (c) afforested areas. (Forest tracts of less than 1 acre and isolated strips of timber less than 120 feet wide are excluded.)

Commercial forest-land area.--Forest land that is (a) producing, or physically capable of producing, usable crops of wood (usually sawtimber), (b) economically available now or prospectively, and (c) not withdrawn from timber utilization through statute, ordinance, or administrative order.

Noncommercial forest-land area.--Forest land (a) withdrawn from timber utilization through statute, ordinance, or administrative order, but that otherwise qualifies as commercial forest land, or (b) incapable of yielding usable wood products (usually sawtimber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.

State Forest Preserve.--Forest land owned by the State of New York in the 16 Forest Preserve Counties of the Adirondack and Catskill regions, as defined by law.

Forest Cover Types

Forest cover types are classified according to the predominant species or species group, as indicated by cubic volume for sawtimber and poletimber stands, and number of trees for seedling-and-sapling stands. The forest cover types found in New York are:

White pine.--Forests in which 75 percent or more of the stand is eastern white pine.

White pine-northern hardwood.--Forests in which 50 to 74 percent of the stand is eastern white pine, but in which sugar maple, beech or yellow birch, singly or in combination, make up 25 to 49 percent of the stand.

Hemlock.--Forests in which 50 percent or more of the stand is eastern hemlock.

Pitch pine.--Forests in which 75 percent or more of the stand is pitch pine.

Spruce-fir.--Forests in which 75 percent or more of the stand is red spruce or balsam fir, singly or in combination.

Spruce-fir-northern hardwood.--Forests in which 50 to 74 percent of the stand is red spruce or balsam fir, singly or in combination, but in which sugar maple, beech or yellow birch, singly or in combination, make up 25 to 49 percent of the stand.

Cedar-tamarack-spruce.--Forests in which 50 percent or more of the stand is northern white-cedar or tamarack, singly or in combination with each other or with spruce.

Northern hardwood.--Forests in which 75 percent or more of the stand is sugar maple, beech, or yellow birch, singly or in combination.

Northern hardwood-spruce-fir.--Forests in which 50 to 74 percent of the stand is sugar maple, beech, or yellow birch, singly or in combination; but in which red spruce or balsam fir, singly or in combination, make up 25 to 49 percent of the stand.

Aspen-gray birch.--Forests in which 50 percent or more of the stand is bigtooth aspen, quaking aspen, balsam poplar, or gray birch, singly or in combination.

Paper birch.--Forests in which 50 percent or more of the stand is paper birch.

Ash-elm-maple.--Forests in which 50 percent or more of the stand is ash, elm, or red maple, singly or in combination.

Red oak.--Forests in which 75 percent or more of the stand is red oak.

White oak.--Forests in which 75 percent or more of the stand is white oak.

Chestnut oak.--Forests in which 75 percent or more of the stand is chestnut oak.

Oak-white pine.--Forests in which 50 percent or more of the stand is oak, but in which eastern white pine makes up 25 to 49 percent of the stand.

Northern hardwood-white pine.--Forests in which 50 to 74 percent of the stand is sugar maple, beech, or yellow birch, singly or in combination, but in which eastern white pine makes up 25 to 49 percent of the stand.

Pitch pine-oak.--Forests in which 50 to 74 percent of the stand is pitch pine, but in which oak makes up 25 to 49 percent of the stand.

Oak-pitch pine.--Forests in which 50 to 74 percent of the stand is oak, but in which pitch pine makes up 25 to 49 percent of the stand.

River birch-sycamore.--Forests in which 50 percent or more of the stand is river birch or sycamore, singly or in combination.

Eastern redcedar.--Forests in which 50 percent or more of the stand is eastern redcedar.

Atlantic white-cedar.--Forests in which 50 percent or more of the stand is Atlantic white-cedar.

Sweetgum--yellow-poplar.--Forests in which 50 percent or more of the stand is sweetgum or yellow-poplar, singly or in combination.

Bottomland hardwood.--Bottomland forests in which black tupelo, sweetgum, white oak, yellow-poplar, red maple, silver maple, elm, and ash, in combination with other hardwoods, constitute 75 percent or more of the stand.

The forest types listed below are national standard types used in National Standard Table No. 3 in the Appendix:

White-red-jack pine.--Forests in which 50 percent or more of the stand is eastern white pine, red pine, or jack pine, singly or in combination. (Common associates include hemlock, aspen, birch, and maple.)

Spruce-fir.--Forests in which 50 percent or more of the stand is spruce or true firs, singly or in combination. (Common associates include white-cedar, tamarack, maple, birch, and hemlock.)

Loblolly-shortleaf pine.--Forests in which 50 percent or more of the stand is loblolly pine, shortleaf pine, or southern yellow pines excepting longleaf or slash pine, singly or in combination. (Common associates include oak, hickory, and gum.)

Oak-hickory.--Forests in which 50 percent or more of the stand is upland oaks or hickory, singly or in combination, except where pines comprise 25-49 percent, in which case the stand would be classified "oak-pine". (Common associates include yellow-poplar, elm, maple, and black walnut.)

Elm-ash-cottonwood.--Forests in which 50 percent or more of the stand is elm, ash, or cottonwood, singly or in combination. (Common associates include willow, sycamore, beech, and maple.)

Maple-beech-birch.--Forests in which 50 percent or more of the stand is maple, beech, or yellow birch, singly or in combination. (Common associates include willow, sycamore, beech, and maple.)

Aspen-birch.--Forests in which 50 percent or more of the stand is aspen, balsam poplar, paper birch, or gray birch, singly or in combination. (Common associates include maple and balsam fir.)

Class Of Timber

Sawtimber trees.--Trees of commercial species that contain at least one merchantable sawlog as defined by regional practice and that are of the following minimum diameters at breast height (d.b.h.): Softwoods 9.0 inches and hardwoods 11.0 inches. (A merchantable sawlog is a portion

of a live tree that meets the minimum log-grade specifications, as defined under log-grade classification.)

Poletimber trees.--Trees of commercial species that meet regional specifications of soundness and form, and are of the following diameters at breast height: Softwoods 5.0 to 9.0 inches; hardwoods 5.0 to 11.0 inches. (Such trees will usually become sawtimber trees if left to grow.)

Seedling-and-sapling trees.--Live trees of commercial species less than 5.0 inches in diameter at breast height and of good form and vigor.

Cull trees.--Live trees of sawtimber or poletimber size that are unmerchantable for sawlogs now or prospectively because of defect or rot, or because they are of undesirable species.

Hardwood limbs.--Limbs of hardwood sawtimber trees and sawtimber-size cull hardwood trees to a minimum diameter of 4.0 inches inside bark.

Stand-Size Classes

Sawtimber stands.--Stands with sawtimber trees having a minimum net volume per acre of 1,500 board feet, International $\frac{1}{4}$-inch rule.

Poletimber stands.--Stands failing to meet the sawtimber stand specifications, but at least 10 percent stocked with poletimber and larger trees (5.0 inches d.b.h. and larger) and with at least half of the minimum stocking in poletimber trees.

Seedling-and-sapling stands.--Stands not qualifying as either sawtimber or poletimber stands, but having at least 10 percent stocking of trees of commercial species, and with at least half the minimum stocking in seedling-and-sapling trees.

Nonstocked and other areas not elsewhere classified.--Areas not qualifying as sawtimber, poletimber, or seedling-and-sapling stands.

Timber Volume

Growing stock.--Net volume, in cubic feet, of live sawtimber trees and live poletimber trees from stump to a minimum 4-inch top (of central stem) inside bark.

Live sawtimber volume.--Net volume in board feet, International $\frac{1}{4}$-inch rule, of live sawtimber trees of commercial species.

Net volume in cubic feet.--Gross volume in cubic feet, less deductions for rot.

Standard cord.--A unit of measure for stacked wood encompassing 128 cubic feet of wood, bark, and air space. Cord estimates are derived from cubic-foot measurements by applying a factor of 80 cubic feet of wood (inside bark) per rough cord.

Net volume in board feet.--Gross volume in board feet (log scale, International $\frac{1}{4}$-inch rule) less deductions for rot, sweep, and other defects affecting use for lumber.

Log Grades

The log grades used in the survey are outlined in figures 9, 10, and 11.

Pulpwood Suitability

The pulpwood specifications used in this report are those set up by the Northeastern and Appalachian Technical Committees of the American Pulpwood Association.

Pulpwood trees

Live trees of commercial species, 5.0 inches d.b.h. and larger, containing at least two contiguous pulpwood bolts and with 50 percent or more of the main stem volume usable for pulpwood. (A pulpwood bolt is a section of the main stem 4 feet long; 4.0 inches or larger inside bark at the small end; free from any indication of rot, charred wood, metal, or hollow center; and contiguous to one or more other bolts that meet the same requirements. Crotches are excluded; sweep or crook in any section shall exclude the bolt if a line from center of top cut to center of bottom cut passes outside the wood at any point.)

Pulpwood stands

0 to 5 cords per acre.--Stands containing trees 5.0 inches (d.b.h.) and larger that meet pulpwood specifications, and having a net volume per acre of less than 400 cubic feet. (Includes seedling-and-sapling stands and nonstocked areas.)

HARDWOOD LOG GRADES FOR STANDARD LUMBER

GRADE FACTORS*		SPECIFICATIONS							
		Log Grade 1			Log Grade 2				Log Grade 3
Position in tree		Butts only	Butts & uppers		Butts & uppers				Butts & uppers
Minimum diameter (inches)		[1]13-15	16-19	20+	[2]11	12+			8+
Minimum length (feet)		10+	10+	10+	10+	8-9	10-11	12+	8+
Clear cuttings** on each of the 3 best faces	Min. length (feet)	7	5	3	3	3	3	3	2
	Max. number	2	2	2	2	2	2	3	--
	Min. yield in face length	5/6	5/6	5/6	2/3	3/4	2/3	2/3	1/2
Max. sweep and crook allowance (percent of gross volume)		15			30				50
Max. cull and sweep allowance (percent of gross volume)		[3]40			[4]50				50

*End defects, although not visible in standing trees, are important in grading cut logs. Instructions for dealing with this factor are contained in Forest Prod. Lab. Rpt. D1737.

**A clear cutting is a portion of a face free of defects, extending the width of the face. A face is one-fourth the surface of the log as divided lengthwise.

[1]Ash and basswood butts can be 12 inches if otherwise meeting requirements for small No. 1's.

[2]10-inch logs of all species can be No. 2 if otherwise meeting requirements for small No. 1's.

[3]Otherwise No. 1 logs with 51-60 percent cull can be No. 2.

[4]Otherwise No. 2 logs with 51-60 percent cull can be No. 3.

Figure 9.

HARDWOOD LOG SPECIFICATIONS FOR TIES AND TIMBERS

GRADE FACTORS		SPECIFICATIONS
Position in tree		Butts and uppers
Scaling diameter (inches)		8+
Length, without trim (feet)		8+
Clear cuttings		No requirements: not graded on cutting basis.
Max. sweep allowance		One-fourth d.i.b. of small end for half logs, and one-half d.i.b. for logs 16 feet long.
Sound surface defects permitted	Single knots	Any number, if none has an average collar* diameter that is more than one-third of log diameter at point of occurrence
	Whorled knots	Any number, provided the sum of the collar diameters does not exceed one-third the log diameter at point of occurrence.
	Holes	Any number not exceeding knot specifications if they do not extend more than 3 inches into the contained tie or timber.
Unsound surface defects** permitted	Any number and size if they do not extend into contained tie or timber. If they extend into contained tie or timber, they shall not exceed size, number, and depth of limits for sound defects.	

*Knot collar is the average of the vertical and horizontal diameters of the limb or knot swelling as measured flush with the surface of the log.

**Interior defects are not visible in standing trees. They are considered in grading cut logs. No interior defects are permitted except one shake not more than one-third the width of the contained tie or timber, and one split not more than 5 inches long.

Figure 10.

WHITE PINE LOG GRADES

Grade	Diameter inside bark (small end)	Length (without trim)	Total deduction permitted [1]	Surface requirements
	Inches	Feet	Percent	
1	13+	8	0	Surface clear 100%
	13-16	12-16	25	Must be 2/3 surface-clear in lengths 8 feet long or longer or 50% surface-clear full length.
	17+	10-16	30	Must be 1/2 surface-clear in lengths 8 feet long or longer or 25% surface-clear full length.
2	9-16	10-16	30	Permits sound, tight knots not over $2\frac{1}{2}$ inches in diameter. Larger, sound, tight knots permitted only if 50% of full-length surface has no sound, tight knots larger than 2 inches in diameter.
	17+	8-16	40	Permits sound, tight knots not over 3 inches in diameter. Larger, sound, tight knots permitted only if 50% of full-length surface has no sound, tight knots larger than $2\frac{1}{2}$ inches in diameter.
3	6-7	8-16	25	Permits sound knots not over 1 inch in diameter or live knots not over 2 inches in diameter.
	8-13	8-16	30	No surface requirements except logs with knots 4 inches or more in diameter in whorls less than 2 feet apart will not be accepted unless 25% or more of full length surface has no sound knots over 2 inches in diameter.
	14+	8-16	40	No surface requirements except that knots over 6 inches in diameter cannot be closer than 3 feet.

[1] Includes sweep, rot, and other cull.

Figure 11.

5 to 15 cords per acre.--Stands containing trees 5.0 inches (d.b.h.) and larger that meet pulpwood specifications, and having a net volume per acre ranging from 400 to 1,200 cubic feet.

15 cords or more per acre.--Stands containing trees 5.0 inches (d.b.h.) and larger that meet pulpwood specifications, and having a net volume per acre of more than 1,200 cubic feet.

Pulpwood volume

Net volume in standard cords (including bark) of the main stem of pulpwood trees, from stump to the point where the top breaks up into branches or to a minimum top diameter of 4.0 inches (inside bark). Deductions are made for all portions of the stem that fail to meet pulpwood bolt requirements.

Growth And Annual Cut

Net annual growth of sawtimber.--The change (resulting from natural causes) in net board-foot volume of live sawtimber on commercial forest land during a specified year.

Ingrowth of sawtimber.--The net board-foot volume of trees that entered live sawtimber during the inventory year as measured at the end of the year.

Annual mortality of sawtimber.--The net board-foot volume removed from live sawtimber on commercial forest land during a specified year through death from natural causes.

Net annual growth of growing stock.--The change (resulting from natural causes) in net cubic-foot volume of growing stock on commercial forest land during a specified year.

Ingrowth of growing stock.--The total net cubic-foot volume of trees that entered growing stock during the inventory year as measured at the end of the year.

Annual mortality of growing stock.--The net cubic-foot volume removed from growing stock during a specified year through death from natural causes.

Annual cut of live sawtimber.--The net board-foot volume of live sawtimber trees cut or killed by logging, and

by land-clearing and cultural operations, on commercial forest land during a specified year.

Annual cut of growing stock.--The net cubic-foot volume of live sawtimber and poletimber trees cut or killed by logging, or by land-clearing and cultural operations, on commercial forest land during a specified year.

FOREST SURVEY METHODS

These forest statistics are based on information obtained from aerial photographs and from sample plots examined on the ground. First, photo-interpretation plots were marked off on the aerial photographs. These plots were distributed uniformly by mechanical means over photographs of the entire State. Trained photo interpreters then classified each photo plot as either forest or nonforest. Forest plots were classified further according to stand size and forest type.

Field crews inspected some of the photo plots on the ground. Enough plots were selected at random to attain a specified level of statistical accuracy. Species and volume data were collected on these ground plots; and the photo classification of stand size and forest type was verified or—if necessary--changed.

Growth was computed from measurements of radial growth and inventory data on numbers of trees by species and diameter class, after adjusting for cutting and expected mortality. Radial growth was measured on increment cores extracted from sample trees. The final estimate was of average annual periodic net growth at the time the inventory was made.

Estimates of timber cut in New York were based on production surveys and wood-utilization studies conducted by the Northeastern Forest Experiment Station. The production surveys yielded estimates of the output of all timber products. From studies conducted on all types of logging operations, estimates of logging residues were developed, which, when added to the volume of timber products, gave estimates of timber cut.

RELIABILITY OF THE ESTIMATES

The estimates in this report may contain two kinds of error. First, photo interpreters may make mistakes in classification and fieldmen may make mistakes in measuring or recording. There is no practical way of finding out just how often such errors occur. But they are kept to a minimum by closely checking all phases of the work.

The second kind of error is inherent in sampling procedures. The size of this sampling error can be measured. If there are no errors of the first kind, the probabilities are two out of three that the actual areas and volumes do not vary from the estimates by more than the following percentages:

Item	Percent (Plus or minus)
Commercial forest-land area	1.3
Sawtimber area	2.1
Poletimber area	2.1
Timber volume, board-foot basis	2.4
Timber volume in sawtimber stands, board-foot basis	2.6
Timber volume in poletimber stands, cubic-foot basis	2.6
Total timber volume, cubic-foot basis	1.4
Growth (board-foot basis)	8.9
Growth (cubic-foot basis)	4.9
Annual cut (cubic-foot basis)	7.9

In every case, total figures are more reliable than subtotals, subtotals are more reliable than any of their component figures. Figures that are small in relation to totals are subject to larger sampling errors. The actual range of errors for county data is as follows:

	Percent of error	
	Low	High
Commercial forest area	±1.2	±11.6
Growing stock volume	±3.4	±107.7

FOREST SURVEY vs. REAPPRAISAL

In 1945, as part of a nationwide reappraisal of the forest resource, the U. S. Forest Service published esti-

mates of forest areas, timber volumes, and growth in New York. Differences between the Reappraisal estimates and the Forest Survey estimates in this report are attributed to the fact that Reappraisal estimates were based largely upon general knowledge and the judgment of informed persons, whereas the accuracy of the present forest survey was controlled by a scientific survey design. In addition, some specifications used in this report are different from specifications used in the Reappraisal. Hence changes in forest conditions in New York cannot be measured by comparing this report with the Reappraisal estimates.

SPECIES TALLIED

The various tree species[2] tallied in New York are listed below in order of relative importance in sawtimber volume (see table 7).

Commercial Species: Softwoods

Hemlock (Eastern hemlock)	- Tsuga canadensis
White pine (Eastern white pine)	- Pinus strobus
Spruce (Red spruce)	- Picea rubens
(White spruce)	- Picea glauca
(Black spruce)	- Picea mariana
Fir (Balsam fir)	- Abies balsamea
Other softwoods	
(Eastern redcedar)	- Juniperus virginiana
(Tamarack)	- Larix laricina
(Red pine)	- Pinus resinosa
(Pitch pine)	- Pinus rigida
(Northern white-cedar)	- Thuja occidentalis
(Atlantic white-cedar)	- Chamaecyparis thyoides

Commercial Species: Hardwoods

Sugar maple	- Acer saccharum
Beech (American beech)	- Fagus grandifolia
Yellow birch	- Betula alleghaniensis
Red maple (Red maple)	- Acer rubrum
(Silver maple)	- Acer saccharinum

[2] LITTLE, ELBERT L., JR. CHECK LIST OF NATIVE AND NATURALIZED TREES OF THE UNITED STATES (INCLUDING ALASKA). U.S. DEPT. AGR., AGR. HANDB. 41. 472 PP. 1953.

Red oak (Northern red oak)	- Quercus rubra
(Black oak)	- Quercus velutina
(Scarlet oak)	- Quercus coccinea
Elm	- Ulmus species
Ash	- Fraxinus species
Basswood (American basswood)	- Tilia americana
White oak (White oak)	- Quercus alba
(Bur oak)	- Quercus macrocarpa
(Swamp white oak)	- Quercus bicolor
Hickory	- Carya species
Black cherry	- Prunus serotina
Aspen (Bigtooth aspen)	- Populus grandidentata
(Quaking aspen)	- Populus tremuloides
Chestnut oak	- Quercus prinus
Other hardwoods	
(Sweet birch)	- Betula lenta
(Paper birch)	- Betula papyrifera
(Yellow-poplar)	- Liriodendron tulipifera
(Sweetgum)	- Liquidambar styraciflua
(Black tupelo)	- Nyssa sylvatica
(Black walnut)	- Juglans nigra
(Black locust)	- Robinia pseudoacacia
(Butternut)	- Juglans cinerea
(Black willow)	- Salix nigra
(American sycamore)	- Platanus occidentalis
(Flowering dogwood)	- Cornus florida
(Cucumbertree)	- Magnolia acuminata
(Balsam poplar)	- Populus balsamifera

Noncommercial Species

Gray birch	- Betula populifolia
Pin cherry	- Prunus pensylvanica
Eastern hophornbeam	- Ostrya virginiana
American hornbeam	- Carpinus caroliniana
Sassafras	- Sassafras albidum
Downy serviceberry	- Amelanchier arborea

AGRICULTURE-FOREST SERVICE-UPPER DARBY

NATIONAL

STANDARD TABLES

The following tables will be found in all forest survey state or subregional reports to enable readers to combine or compare the data with similar data for other areas and to facilitate compilations on a national scale.

National Standard Table 1.--Land area, by major classes of land, New York, 1950

Class of land	Area
	Thousand acres
Forest:	
Commercial	12,002
Noncommercial:	
Productive-reserved	2,352
Unproductive	96
Total	14,450
Nonforest[1]	16,234
Total, all classes	30,684

[1]Includes 111,500 acres of water according to Survey standards of area classification but defined by the Bureau of Census as land.

National Standard Table 2.--Commercial forest-land area by ownership and stand-size classes, New York, 1950

Ownership class	Total	Saw-timber stands	Pole-timber stands	Seedling-and-sapling stands	Nonstocked and other areas[1]
	Thousand acres	Thousand acres	Thousand acres	Thousand acres	Thousand acres
Federally owned or managed[2]	99	17	25	21	36
State	714	314	228	136	36
County and municipal	83	19	45	17	2
Private:					
Farm	3,472	972	1,122	1,278	100
Industrial and other	7,634	3,237	2,856	1,373	168
Total	11,106	4,209	3,978	2,651	268
All ownerships	12,002	4,559	4,276	2,825	342

[1]Includes areas not classified elsewhere.

[2]There is no BLM, National forest, or Indian forest land in New York.

National Standard Table 3.--Area of commercial forest land, by major forest types, New York, 1950

Forest type	Area
	Thousand acres
White-red-jack pine[1]	670
Spruce-fir[2]	735
Loblolly-shortleaf pine[3]	162
Oak-hickory[4]	1,945
Elm-ash-cottonwood[5]	872
Maple-beech-birch[6]	5,894
Aspen-birch[7]	1,724
Total	12,002

[1]Includes the white pine and white pine-northern hardwood types.

[2]Includes the spruce-fir, spruce-fir-northern hardwood, and cedar-tamarack-spruce types.

[3]Includes the pitch pine and pitch pine-oak types.

[4]Includes the red oak, white oak, chestnut oak, oak-white pine, oak-pitch pine, eastern redcedar, and sweetgum--yellow-poplar types.

[5]Includes the ash-elm-maple, river birch-sycamore and bottomland hardwood types, and a small acreage of Atlantic white-cedar.

[6]Includes the hemlock, northern hardwood, northern hardwood-spruce-fir and northern hardwood-white pine types.

[7]Includes the aspen-gray birch and paper birch types.

National Standard Table 4.--Net volume of live sawtimber and growing stock on commercial forest land, by stand-size class, New York, 1950

Stand-size class	Saw-timber	Growing stock
	Million bd.ft.	Million cu.ft.
Sawtimber stands	21,858	7,217
Poletimber stands	2,942	3,240
Seedling-and-sapling stands	584	409
Nonstocked and other areas not elsewhere classified	97	39
Total	25,481	10,905

National Standard Table 5.--Net volume of live sawtimber and growing stock on commercial forest land, by ownership class, New York, 1950

Ownership class	Saw-timber	Growing stock
	Million bd.ft.	Million cu.ft.
Federally owned or managed	97	63
State	1,878	844
County and municipal	69	74
Private:		
Farm	4,988	3,005
Industrial and other	18,449	6,919
Total	23,437	9,924
All ownerships	25,481	10,905

National Standard Table 6.--Net volume of live sawtimber and growing stock on commercial forest land, by species, New York, 1950

Species[1]	Saw-timber	Growing stock
	Million bd.ft.	Million cu.ft.
Softwoods:		
Spruce and balsam fir	1,655	693
White and red pines	2,284	753
Hemlock	2,305	880
Other eastern softwoods	258	157
Total	6,502	2,483
Hardwoods:		
White oaks[2]	589	233
Red oaks[3]	1,639	692
Other white oaks	207	219
Yellow birch	2,446	878
Sugar maple	4,639	1,803
Soft maples	1,919	1,225
Beech	2,749	964
Ash	943	482
Hickory	249	131
Cottonwood and aspen	246	351
Basswood	914	367
Other eastern hardwoods	2,439	1,077
Total	18,979	8,422
All species	25,481	10,905

[1]Species from the national standard list that do not appear here are either not present in New York or were found so infrequently that no reliable estimate of volume could be made.

[2]*Quercus alba* only.

[3]*Quercus rubra* only.

National Standard Table 7.--Net volume of live sawtimber on commercial forest land, by diameter-class group and species, New York, 1950

Species	Diameter-class group						
	10	12	14	16	18	20 and more	Total
	Million board feet						
Spruce and balsam fir	409	410	355	227	128	126	1,655
White and red pines	328	453	414	400	276	413	2,284
Hemlock	439	477	448	297	231	413	2,305
Other eastern softwoods	58	74	68	32	12	14	258
Total	1,234	1,414	1,285	956	647	966	6,502
White oak	--	125	130	109	65	160	589
Red oak	--	405	360	315	210	349	1,639
Other white oaks	--	89	58	34	10	16	207
Yellow birch	--	298	326	319	307	1,196	2,446
Sugar maple	--	800	797	767	721	1,554	4,639
Soft maples	--	527	393	331	217	451	1,919
Beech	--	532	629	595	466	527	2,749
Ash	--	297	259	141	100	146	943
Hickory	--	69	65	42	23	50	249
Cottonwood and aspen	--	129	62	35	20	--	246
Basswood	--	191	204	154	118	247	914
Other eastern hardwoods	--	543	499	393	284	720	2,439
Total	--	4,005	3,782	3,235	2,541	5,416	18,979
All species	1,234	5,419	5,067	4,191	3,188	6,382	25,481

National Standard Table 8.--Net volume of all timber on commercial forest land, by class of material and species group, New York, 1950

Class of material	Total	Softwoods	Hardwoods
	Million cu.ft.	Million cu.ft.	Million cu.ft.
Growing stock:			
Sawtimber trees:			
Sawlog portion	5,034	1,412	3,622
Upper stem portion	1,248	342	906
Total	6,282	1,754	4,528
Poletimber trees	4,623	729	3,894
Total growing stock	10,905	2,483	8,422
Other material:			
Sound cull trees	1,061	188	873
Rotten cull trees	814	45	769
Hardwood limbs	799	--	799
Salvable dead trees	--	--	--
Total other material	2,674	233	2,441
Total, all timber	13,579	2,716	10,863

National Standard Table 9.--Net annual growth, annual mortality, and annual cut of live sawtimber and growing stock on commercial forest land, by species group, New York, 1952

Item	Sawtimber			Growing stock		
	Total	Softwoods	Hardwoods	Total	Softwoods	Hardwoods
	Million board feet			Million cubic feet		
Net annual growth	1,041	214	827	393	66	327
Annual mortality	147	61	86	104	34	70
Annual cut						
Timber products	576	218	358	119	47	72
Logging residues	54	7	47	22	5	17
Total	630	225	405	141	52	89

National Standard Table 10.--Output of timber products and annual cut of live sawtimber and growing stock, New York, 1952

Product	Output of timber products[1]					Annual cut of sawtimber			Annual cut of growing stock		
	Volume in standard units		Roundwood volume								
	Standard units	Number	Total	Soft-woods	Hard-woods	Total	Soft-woods	Hard-woods	Total	Soft-woods	Hard-woods
			M cubic feet			M board feet			M cubic feet		
Sawlogs	M. bd.ft.[2]	483,926	78,575	32,504	46,071	474,200	168,252	305,948	91,941	33,133	58,808
Veneer logs and bolts	M. bd.ft.[2]	19,118	3,083	--	3,083	20,652	--	20,652	3,970	--	3,970
Cooperage logs and bolts	M. bd.ft.[2]	--	--	--	--	--	--	--	--	--	--
Pulpwood	Std. cords[3]	[4]408,637	32,710	27,800	4,910	68,848	54,765	14,083	22,218	17,225	4,993
Fuelwood	Std. cords[3]	[5]533,038	42,643	2,426	40,217	35,629	956	34,673	14,233	371	13,862
Piling	M. linear ft.	432	260	60	200	1,373	311	1,062	313	69	244
Poles	M. pieces	3	39	39	--	160	160	--	41	41	--
Posts	M. pieces	5,710	3,534	547	2,987	5,717	444	5,273	3,040	462	2,578
Hewn ties	M. pieces	--	--	--	--	--	--	--	--	--	--
Mine timbers	M. cu.ft.	18	18	--	18	34	--	34	19	--	19
Miscellaneous[6]	M. cu.ft.	[7]3,877	3,877	--	3,877	23,802	--	23,802	4,795	--	4,795
Total	xxxx	xxxx	164,739	63,376	101,363	630,415	224,888	405,527	140,570	51,301	89,269

[1] Includes material from both growing stock and other miscellaneous sources.

[2] International ¼-inch rule.

[3] Rough wood basis.

[4] Not including 210,000 cubic feet of wood from mill residues used for pulp.

[5] Not including 14,483,000 cubic feet of wood from mill residues (at sawmills and veneer mills) used for domestic and industrial fuel.

[6] Includes shingle bolts, excelsior, chemical wood, split products, etc.

[7] Not including 964,000 cubic feet of wood from mill residues used for miscellaneous products.